

COMBINATORICS
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On large multipartite subgraphs of H-free graphs

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Abstract: A long-standing conjecture of Erdős states that any n -vertex triangle-free graph can be made bipartite by deleting at most $n^2/25$ edges. In this talk, we study how many edges need to be removed from an H -free graph for a general graph H . By generalizing a result of Sudakov for 4-colorable graphs H , we show that if H is 6-colorable then G can be made bipartite by deleting at most $4n^2/25 + O(n)$ edges. In the case of $H = K_6$, we actually prove the exact bound $4n^2/25$ and show that this amount is needed only in the case G is a complete 5-partite graph with balanced parts. As one of the steps in the proof, we use a strengthening of a result of Füredi on stable version of Turán's theorem.

This is a joint work with P. Hu, B. Lidický, T. Martins-Lopez and S. Norin.

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